ETV for Add-On NOx Controls Technical Panel Meeting

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Dreyfus Auditorium

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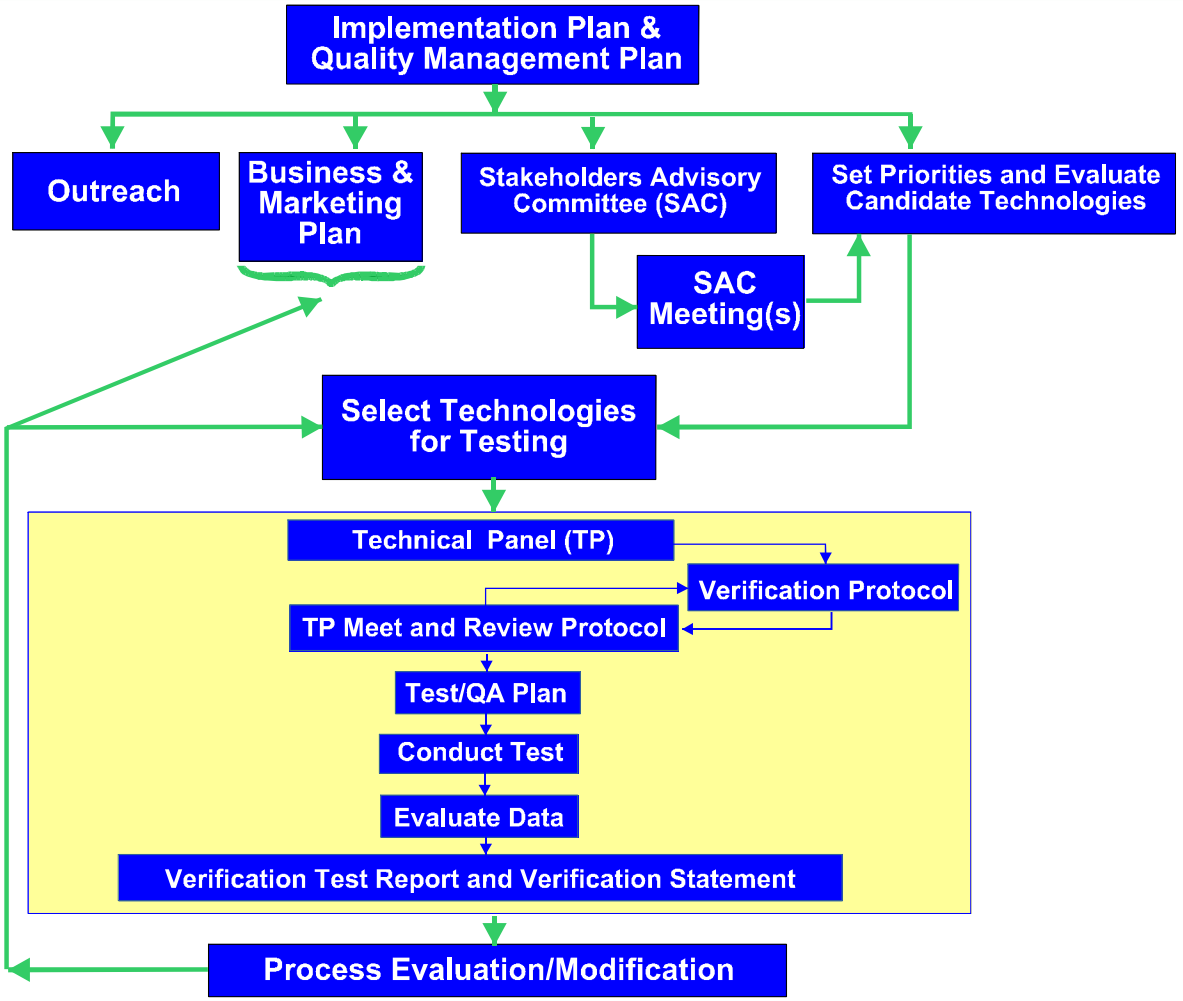
Overview

- *The "Process"*
- *Schedule*
- *Today's Goals*
- *Generic Protocol Issues*

The Verification Process



Technical Panel

- *Regulators*
  - *Thomas Logan, US EPA*
  - *Douglas Grano, US EPA*
  - *Charles B. Sedman, US EPA*
  - *Krish Ramamurthy, State of PA*
  - *Michael Pjetraj, State of NC*
- *Vendors*
  - *Les Cadigan, Comply Technology, Ltd.*
  - *Phillipp Brundrett, CRI Catalyst Company*
  - *J. Charles Solt, Calalytica Combustion Systems*
  - *Mark Anderson, BOC Gases Americas*
- *Users*
  - *Ann Dougherty, Portland Cement Association*
  - *Dennis Knisley, Eastman Kodak*
  - *Norbert R. Wright, Anheuser- Busch, Inc.*
- *Staff*
  - *Douglas VanOsdell, RTI*
  - *Eugene Tatsch, RTI*
  - *Drew Trenholm, MRI*
  - *Craig Clapsaddle, MRI*

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Verification Schedule

Generic Protocol Draft to TP	2/15/99
Technical Panel Meeting	3/04/99
3rd Draft Protocol	3/15/99
Final Draft Protocol	
• TP Review 3/30/99; Editorial by 4/9/99; Admin.	4/21/99
Testing	
• Test/QA Plan	4/21/99
• Vendor Meeting	3/26/99
• Test #1	7/12 - 19/99
Test Report/Verification Statement	
• Complete Peer/QA Review (Report only)	8/20/99
• Complete EPA/RTP Editorial Review	9/20/99
• Complete EPA/RTP Admin. Review	9/24/99
• Submit Reports/Statements to EPA/Cincinnati	10/8/99

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Today's Goals

- *Agree on specific quantitative objectives for testing as stated in Generic Protocol*
- *Review Generic Protocol*
  - *Identify sections needing work*
    - *Disagreement*
    - *Needing more development*
  - *Identify areas of agreement*
  - *Identify anything that was missed*
- *Identify Next NOx Control Area for Verification*

Scope of Verification

- *What is the performance of the technology relative to the manufacturer's statement of capabilities (e.g., percent NO_x removal);*
- *What are the test conditions at which the performance is measured (e.g., air flow rate, percent of rated capacity, temperature, inlet NOx concentration, oxidizing agent injection rate);*
- *What are the associated environmental impacts of operating the equipment (e.g., effects on other pollutant emission rates); and*
- *What are the resources associated with operating the equipment (e.g., energy, water, ozone)?*

Principal Protocol Issues

- *What constitutes "Measurement of Performance"? Generic Protocol specifies:*
  - *Scale: Make measurement at full-size field installation, with pilot unit on a slip stream, or pilot unit on a laboratory combustor.*
  - *Critical Measurement: Efficiency measured to a tight confidence interval over known operating parameters*
  - *Operating and Ancillary Parameters such as operating factors, maintenance and associated environmental impacts are tertiary "measurements"*
  - *Limitations:*
    - *Short-term testing*
    - *Testing at single installation*
- *Drew Trenholm will lead further discussion*

Verification Test Scale

The possible options for scale of the control device are a full scale installation, a pilot (transportable) device operated on a slip stream at a full scale facility, and a pilot device operated at a controlled laboratory facility (e.g., EPA, ORD's combustion facilities). Factors that will influence the choice of scale include:

1. the type of device available,
2. the need to test an actual vs simulated pollutant source,
3. the need to control the source to test under varied conditions,
4. test costs, and
5. practical source testing constraints.

A full scale facility will provide a test that best matches real world conditions but offers limited flexibility to test the device under as wide a range of conditions as a vendor may request. A laboratory facility provides the most control of source and device operating conditions which allows the test to cover the broadest range of conditions but is the least representative of real world conditions. A pilot device on a slip stream at a full scale facility provides a compromise between the two other approaches.

Page 7, Line 27, Generic Protocol

Critical Measurement

2.3 Data Quality Objectives

Specific DQOs will be included in each test/QA Plan for all key measurements. DQOs may vary between different test plans written in conformance to this generic protocol. **The critical measurement has been identified to be control device NOx removal efficiency. The test/QA plan will include measurements sufficient to allow determination of the APCT performance to within ±5 percent removal efficiency (e.g., 90% removal determined as 90 ± 5 percent removal). If absolute NOx emission concentration is measured instead of removal efficiency, the DQO for the overall emission measurement is ± 5 percent of the emission concentration above 5 ppm, and ±15 percent below 5 ppm.**

Page 4, Generic Protocol

Ancillary Measurements

- What are the test conditions at which the performance is measured (e.g., air flow rate, percent of rated capacity, temperature, inlet NOx concentration, oxidizing agent injection rate)?
- What are the associated environmental impacts of operating the equipment (e.g., effects on other pollutant emission rates); and
- What are the resources associated with operating the equipment (e.g., energy, water, ozone)?

Page 4, Generic Protocol

Limitations

A couple of types of potential variability in a verification result will not be addressed for reasons of cost and practical difficulty. One is changes in performance over time. The verification will only address performance during a one time test. The second potential variability that will not be covered is performance differences from APCT device to device.

Page 8, Line 11, Generic Protocol